Specification

Product Name： EHVS500-BMU High Voltage Energy Storage System

Product Model： EHVS500-BMU32S-V1.1

Version	Date	Editor	Version Revision Note
V1.0	2024.06.14	Wang Tao	Create first draft
V1.1	2024.06.28	Wang Tao	Modify the partial interface description

Content

一、Product Description

EHVS500 Is a set of control management system for series structure of energy storage batteries. The system consists mainly of three parts, BCU, BMU and power. Its main function is to manage and control the battery cluster in the series energy storage battery system. Usually, the BMU module in EHVS500 is placed in the single battery PACK of the high voltage system, which is responsible for monitoring and collecting real-time data such as the voltage and temperature of the battery. The BCU module will be placed in the main control box of the high-voltage system to better monitor and manage the status of the battery cluster.

BMU (Battery Management Unit)

The device is a battery parameter unit that is specially designed for energy storage devices. Its main function is to monitor real-time data such as the cell voltage and cell temperature of each battery pack in real time. The data will be uploaded to the BCU for the analysis and calculation of parameters such as battery health, residual capacity, and charge-discharge efficiency.

二、Scope Of Application

EHVS500-BMU is a data acquisition module designed specifically for the high-voltage energy storage battery management system. The main function of the module is to monitor the running state of the cell and balance the voltage of each cell.

First, the EHVS500-BMU has real-time monitoring of the state of the cell. Through the built-in sensor and monitoring equipment, the key parameters such as voltage and temperature of the cell are obtained in real time to provide effective real-time parameters for BCU. These data can help the BCU to find the possible problems of the cell group in time, so that it can take corresponding measures to deal with them .

三、Normative Application Documents

The following documents are essential for the application of this document. For all dated references, only the dated version applies to this file. For undated references, the latest version (including all modifications) applies to this file;

EMC-surge immunity standard in Table 5,6.15 of《GB/T34131-2023 Battery management system for electric energy storage》requirements of GB / T 17626.5 grade 3, usual line 1kV, ground line 2kV;

Standard for the immunity of electrostatic discharge in Table 5,6.15 of《GB/T34131-2023 Battery management system for electric energy storage》requirements of GB / T 17626.2 grade

3, it can withstand contact discharge 6kV, air discharge 8kV;

dielectric strength in Table 5,6.15 of《GB/T34131-2023 Battery management system for electric energy storage》:between the battery management system and the acquisition terminal and the ground terminal connected to the battery、between the communication terminal and the ground terminal、between the acquisition terminal and the power supply terminal、between the acquisition terminals and the communication terminals、between the power supply terminal and the communication terminal、which should withstand the specified power frequency AC voltage of 1min 2120V(DC voltage: 3000V), no insulation breakdown and flashover phenomenon and the leakage current is less than 10 mA;

Standard for the immunity of electrostatic discharge in Table 5,6.15 of《GB/T34131-2023 Battery management system for electric energy storage》requirements of GB / T 17626.4 grade 3, that the power port and the ground port(PE):Voltage peak at 2kV repeat frequency 5 or 100 kHZ; the Signal ports and the control ports:Voltage peak at 1kV repeat frequency 5 or 100 kHZ.

四、Functional Characteristics

4.1、Data Processing Control

- The real-time data information of the collected cell will be uploaded to BCU through CAN communication. After BCU processing, the management and system of battery pack / cluster charging and discharge will be realized.
- Thermal management control function: the functional interface can provide active cold and heat management of the battery pack according to the battery temperature state, and realize the temperature control function of cooling or heating, so as to prolong the service life of the battery pack.
- Passive balancing function: balance the voltage between the cells during the system operation (charging state, discharge state, standby state) to reduce the cell voltage difference in the system.

4.2、Measuring Ability

For the detection of the group voltage: through the isolation collection and processing of the group voltage, to achieve the real-time monitoring of the group voltage.

4.3、Communication

- CAN: Implement the information interaction with the BCU

The BMU can upgrade the firmware online through the upper computer.

4.4、Low Power Consumption Mode

- Low power consumption working mode, prolong the service time and energy loss of the battery pack.

4.5、Series Communication Function

- Automatic address coding is an automated process that can automatically assign and manage addresses to data. This encoding method can improve the efficiency and accuracy of data processing.

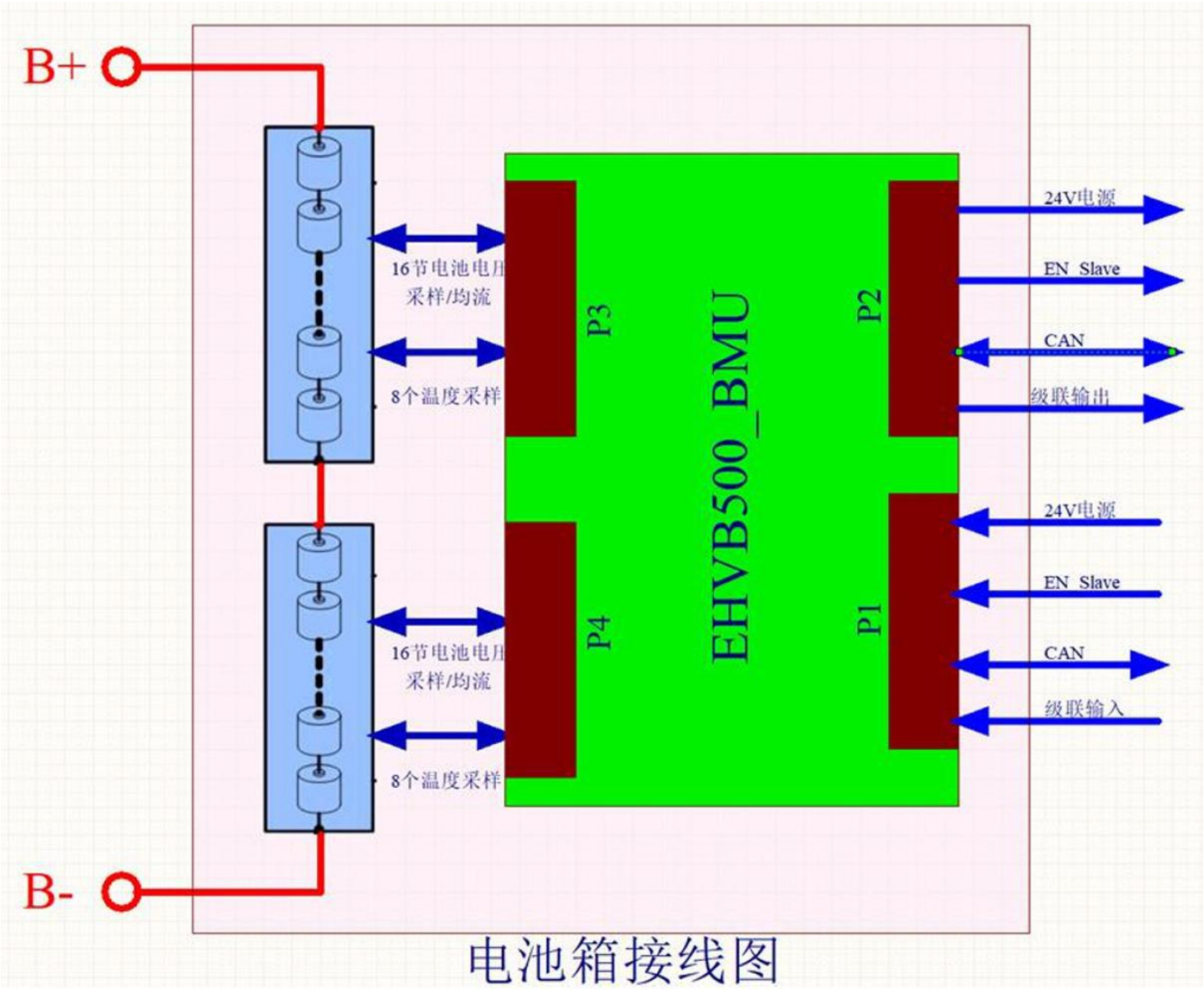
五、Technical Parameter

5.1、BMU Main Parameter

Main parameters of the system		
Scope of applicable voltage	48V-800V	
Low voltage power supply	18V-36V	
Consumption	Standby power consumption	BMU Standby power consumption≤0.5W
	Sleep power consumption	BMU Sleep power consumption≤0.01W
Voltage sampling	Sampling range	BMU Samples the monomer voltage acquisition range 0-5V
	Sampling accuracy	acquisition error≤±5mV accuracy 0.2% FS
Temperature sampling	Sampling range	-40℃~+125℃
	Sampling accuracy	the temperature detection accuracy is±2℃
	Sampling period	100ms
	Sampling road number	BMU：18
Communication mode	CAN	baud rate：250Kbps
Number of module battery strings	32S	
Module temperature	16	

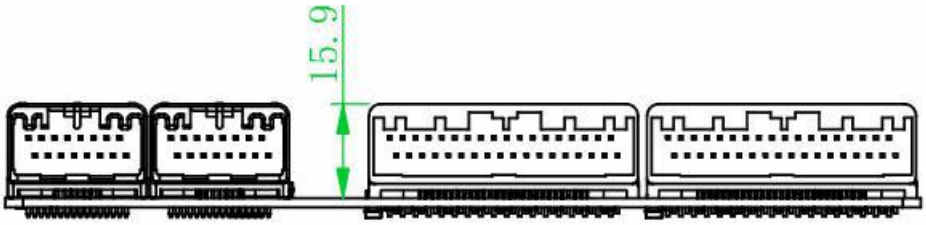
Quantity	

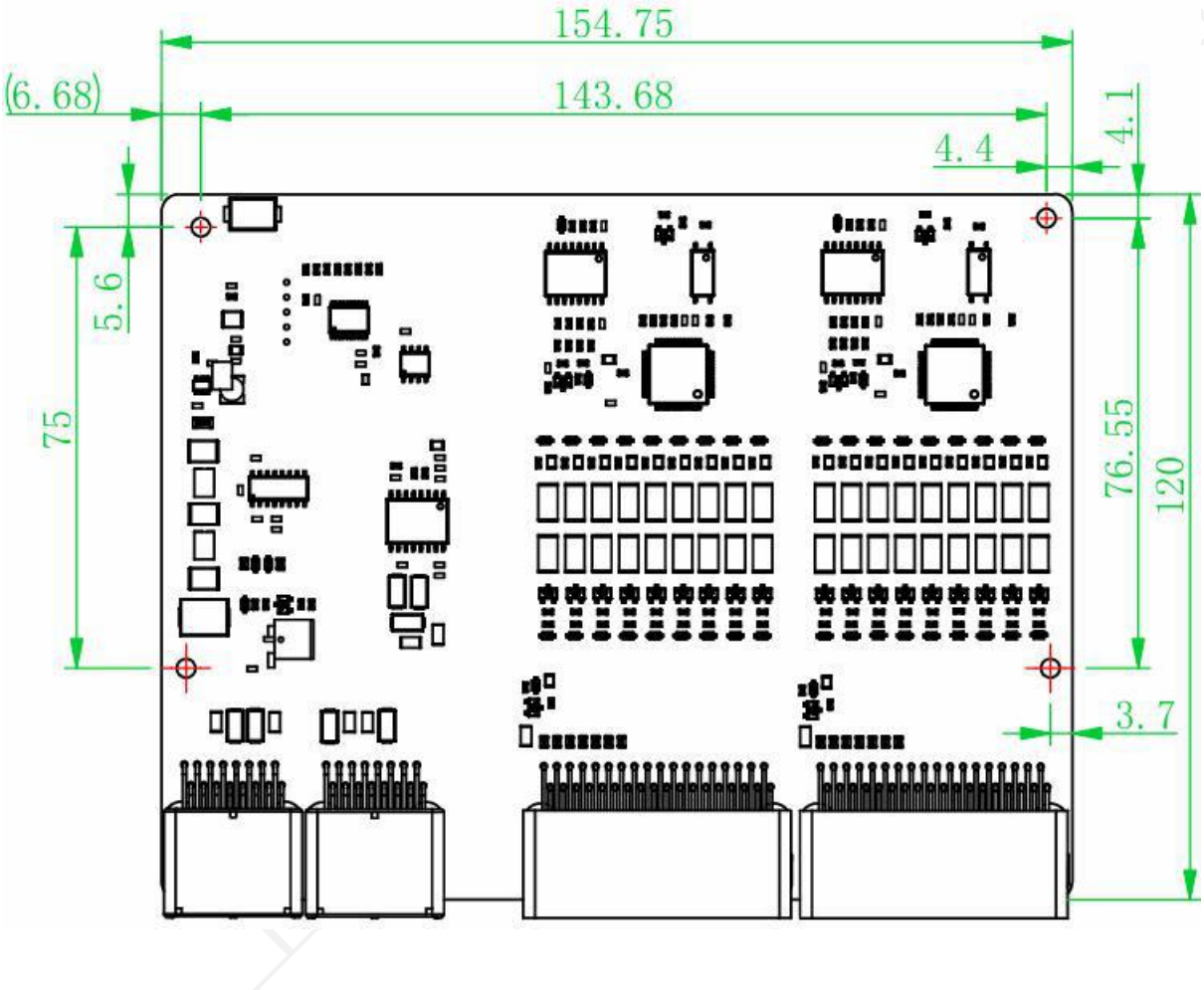
5.2、BMU Connection Diagram



电池箱接线图

5.3、BMU Appearance Size Diagram





六、Interface Definition

6.1、Joint Input Interface

The pin number	Defined declaration	Describe	The pin number	Defined declaration	Describe
1	CAN_H	CAN High interface	9	CAN_L	CAN low interface
2	NC	Continue to have	10	GND_CAN	CAN ground interface
3	FANPWR+	Fan power supply	11	FANPWWR+	Fan power supply
4	GND_12/24V	Fan power supply ground	12	GND_12/24V	Fan power supply ground
5	PWR_IN+	Fan power input	13	PWR_IN+	Fan power input
6	GND_12/24V	Fan power supply ground	14	GND_12/24V	12/24V power ground
7	EN_Slave	BMU operation control pin	15	SAD_OUT	Serial cascade signal output
8	VDD_12/24	12/24V power input	16	GND_12/24V	12/24V power ground

6.2、Joint Level Output Interface

The pin number	Defined declaration	Describe	The pin number	Defined declaration	Describe
PIN1	CAN_H	CAN High interface	PIN9	CAN_L	CAN low interface
PIN2	NC	Continue to have	PIN10	GND_CAN	CAN ground interface
PIN3	FAN_DSI	Fan speed regulation signal	PIN11	FAN_FB	Fan speed feedback signal
PIN4	GND_12/24V	Fan power supply ground	PIN12	GND_12/24V	Fan power supply ground
PIN5	PWR_IN+	Fan power input	PIN13	PWR_IN+	Fan power input
PIN6	GND_12/24V	Fan power supply ground	PIN14	GND_12/24V	Fan power supply ground
PIN7	EN_Slave	BMU operation control pin	PIN15	SAD_IN	Serial cascade signal input
PIN8	VDD_12/24	12/24V power input	PIN16	GND_12/24V	12/24V power ground

6.3、Battery Sampling 1 Interface

The pin number	Defined declaration	Describe	The pin number	Defined declaration	Describe
PIN1	B1_TEMP8	High-level thermistor input 8	PIN19	B1_GND	High-level thermistor input 8
PIN2	B1_TEMP7	High-level thermistor input 7	PIN20	B1_GND	High-level thermistor input 7
PIN3	B1_TEMP6	High-level thermistor input 6	PIN21	B1_GND	High-level thermistor input 6
PIN4	B1_TEMP5	High-level thermistor input 5	PIN22	B1_GND	High-level thermistor input 5
PIN5	B1_TEMP4	High-level thermistor input 4	PIN23	B1_GND	High-level thermistor input 4
PIN6	B1_TEMP3	High-level thermistor input 3	PIN24	B1_GND	High-level thermistor input 3
PIN7	B1_TEMP2	High-level thermistor input 2	PIN25	B1_GND	High-level thermistor input 2
PIN8	B1_TEMP1	High-level thermistor input1	PIN26	B1_GND	High-level thermistor input1
PIN9	B1_GND	High section 1 battery negative electrode	PIN27	B1_GND	High section 1 battery negative electrode
PIN10	B1_BAT2	High section 2 battery positive electrode	PIN28	B1_BAT1	High section 1 battery positive electrode
PIN11	B1_BAT4	High section 4 battery positive electrode	PIN29	B1_BAT3	High section 3 battery positive electrode
PIN12	B1_BAT6	High section 6 battery positive electrode	PIN30	B1_BAT5	High section 5 battery positive electrode
PIN13	B1_BAT8	High section 8 battery positive electrode	PIN31	B1_BAT7	High section 7 battery positive electrode
PIN14	B1_BAT10	High section 10 battery positive electrode	PIN32	B1_BAT9	High section 9 battery positive electrode
PIN15	B1_BAT12	High section 12 battery positive electrode	PIN33	B1_BAT11	High section 11 battery positive electrode
PIN16	B1_BAT14	High section 14 battery positive electrode	PIN34	B1_BAT13	High section 13 battery positive electrode
PIN17	B1_BAT16	High section 16 battery positive electrode	PIN35	B1_BAT15	High section 15 battery positive electrode
PIN18	B1_BAT18	ununited	PIN36	B1_BAT17	ununited

6.4、Battery Sampling 2 Interface

The pin number	Defined declaration	Describe	The pin number	Defined declaration	Describe
PIN1	B2_TEMP8	Low-segment thermistor input 8	PIN19	B2_GND	Low-segment thermistor input 8
PIN2	B2_TEMP7	Low-segment thermistor input 7	PIN20	B2_GND	Low-segment thermistor input 7
PIN3	B2_TEMP6	Low-segment thermistor input 6	PIN21	B2_GND	Low-segment thermistor input 6
PIN4	B2_TEMP5	Low-segment thermistor input 5	PIN22	B2_GND	Low-segment thermistor input 5
PIN5	B2_TEMP4	Low-segment thermistor input 4	PIN23	B2_GND	Low-segment thermistor input 4
PIN6	B2_TEMP3	Low-segment thermistor input 3	PIN24	B2_GND	Low-segment thermistor input 3
PIN7	B2_TEMP2	Low-segment thermistor input2	PIN25	B2_GND	Low-segment thermistor input2
PIN8	B2_TEMP1	Low-segment thermistor input1	PIN26	B2_GND	Low-segment thermistor input1
PIN9	B2_GND	Low section 1 battery negative electrode	PIN27	B2_GND	Low section 1 battery negative electrode
PIN10	B2_BAT2	Low section 2 battery positive electrode	PIN28	B2_BAT1	Lower section 1 battery positive electrode
PIN11	B2_BAT4	Lower section 4 battery positive electrode	PIN29	B2_BAT3	Lower section 3 battery positive electrode
PIN12	B2_BAT6	Low section 6 battery positive electrode	PIN30	B2_BAT5	Low section 5 battery positive electrode
PIN13	B2_BAT8	Lower section 8 battery positive electrode	PIN31	B2_BAT7	Low section 7 battery positive electrode
PIN14	B2_BAT10	Low section 10 battery positive electrode	PIN32	B2_BAT9	Low section 9 battery positive electrode
PIN15	B2_BAT12	Low section 12 battery positive electrode	PIN33	B2_BAT11	Low section 11 battery positive electrode
PIN16	B2_BAT14	Low section 14 battery positive electrode	PIN34	B2_BAT13	Low section 13 battery positive electrode
PIN17	B2_BAT16	Low section 16 battery positive electrode	PIN35	B2_BAT15	Low section 15 battery positive electrode
PIN18	B2_BAT18	ununited	PIN36	B2_BAT17	ununited

七、Precautions For Use

Lithium battery energy storage system is often composed of hundreds or more batteries in series and parallel, and the voltage is often hundreds to one kilovolts. During the installation, debugging and use, safety protection measures must be taken in accordance with the relevant safety regulations to avoid the occurrence of safety accidents.

Rigorous matters	There is high voltage in the energy storage system. For technical personnel not authorized by the company or the company, it is strictly prohibited to open the case for disassembly and maintenance without authorization, otherwise there is the possibility of electric shock, and the warranty right is lost.
	Do not attach any wire head or connector in the BMS to the positive and negative electrode of the battery, otherwise there may be a risk of short circuit and damage to the circuit board.
	Do not connect the slave BMU when the main BCU is charged to avoid possible damage to BMS,Except for special emergency, it is strictly prohibited to cut the power bus circuit breaker in the main circuit.
Safety precautions	The tools used by the installation and commissioning personnel shall have insulation protection. During installation, debugging and maintenance, wear insulated rubber gloves, goggles and insulated rubber boots according to the situation to avoid safety accidents as far as possible. If the wire metal generated during the installation, debugging and maintenance falls into the battery room, please be sure to use the insulation tool, and do not leave the sundries out.
	When maintenance is required, the main circuit breaker must be disconnected to connect the battery pack to the PCS DC bus.
	According to the different project requirements, the parameters such as charge and discharge current and charge and discharge voltage of the battery management system have been set during the initial installation and debugging, and the parameters shall not be changed without authorization, otherwise the battery life may be shortened, and the more serious ones may cause serious harm to the battery and

	cause safety accidents.
	Try to avoid long-term use in the following working environments: Places with strong vibration or vulnerable to impact. Places exceeding the temperature or humidity range specified in the specification. In direct sunlight or near a heat source. There are dust, strong corrosive substances, flammable and explosive substances, high salt fog places.